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The impact of Nature-based tourism activities promoted by tour operators on the environmental perception of visitors

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Abstract

Nature-based tourism can play a relevant role in the environmental education of tourists, providing unique experiences of direct interaction with Nature and perceiving in 'first hand' the importance of Nature's sustainable development and management, as a way to protect and conserve the environment. Thus, it is of high interest that environmental education projects and activities conducted in the field of Nature-based tourism are properly planned, executed and monitored in order to effectively and efficiently generate positive impacts on citizens' knowledge, attitudes, and behaviour, as well as in their level of satisfaction. It is recognized that of the success of Nature-based tourism depends on the effectiveness of the environmental education practice and on the satisfaction generated in the participants, and vice versa. Despite the various studies that investigates this theme, it still remains some disagreement, between authors, about the theoretical assumptions that the activities of Nature-based tourism for environmental education actually generate positive impacts on the knowledge and environmental awareness of the tourists. Few studies investigate the relationship between the educational approaches and techniques used in this kind of activities and the respective impacts obtained. In this study, pre-activity and post-activity surveys were carried out among participants of diverse Nature-based tourism activities conducted by tourism entities operating around the Lisbon region. This before-and-after survey method allowed to assess the level of knowledge and environmental awareness acquired by the participants with the engagement on these activities, in other words, the impact generated. The activities were monitored in order to observe the educational techniques and approaches used and to relate them with the recorded impacts. After engaging in the activities, only 17% of respondents acquired new knowledge about environmental problems, 16% about the local flora, 20% about the local fauna and 12% about the sites' environmental importance. However, almost half of the reporting population showed an incorrect notion of their knowledge, both before and after the activities. Still, all participants were satisfied with the activities. The results show that positive impacts were dominant regarding the Nature-based tourism activities surveyed. However, and in general, the activities have not shown to have a design and a plan that were fully effective and efficient in achieving their educational goals. Future studies may deepen knowledge about the impacts that each educational technique and approach generates, from the perspective of the participant, and about the mechanisms that convert the positive impacts into long-term learning. It may also be interesting to understand and assess the various factors that contribute to the participants' satisfaction in order to correlate the type of impact generated with their satisfaction level. It may be suggested the development - for subsequent implementation - of a general check-list of good-practices, followed by tourism entities in the planning and execution of activities, and an activity design template that integrates these good. In Portugal, it is necessary to invest in more dynamic and versatile Nature-based tourism activities, to improve activities' support structures, to increase the monitoring of protected areas and activities developed there, to have a more prolonged and constant offer of activities throughout the year and enforce the promotion of this offer, nationally as well as internationally. The success of environmental education is the key to an active and responsible society and conscientious of the environmental issues and, therefore, for a sustainable environmental development and management.

Keywords: Nature-based tourism; Environmental awareness; Impact Assessment; Environmental education; Sustainable development.

Resumo

O turismo de Natureza pode desempenhar um papel relevante na educação ambiental dos turistas, proporcionando experiências únicas de interação direta com a Natureza e percecionar em 'primeira-mão' a importância da gestão e desenvolvimento sustentáveis da Natureza, como forma de proteger e conservar o meio Ambiente. Assim, é de elevado interesse que os projetos e atividades de educação ambiental conduzidos no âmbito do turismo de Natureza sejam devidamente planeados, executados e monitorizados, de modo a gerarem de forma eficaz e eficiente impactos positivos no conhecimento, consciência, atitudes e comportamentos do turista, tal como no seu nível de satisfação. É reconhecido que do sucesso do turismo de Natureza depende a eficácia da educação ambiental aí praticada e a satisfação dos participantes, e vice-versa. Apesar dos vários estudos que se debruçaram sobre esta temática, ainda permanecem algumas discordâncias entre autores, relativamente às assunções teóricas de que as atividades de turismo de Natureza contribuem para a educação ambiental e que realmente geram impactos positivos no conhecimento e consciência ambiental do turista. Poucos estudos têm avaliado a relação que existe entre as abordagens e técnicas educativas utilizadas neste género de atividades e os respetivos impactos obtidos. Neste estudo, foram realizados inquéritos, pré-atividade e pós-atividade, a participantes de diversas atividades de turismo de Natureza, conduzidas por operadores turísticos na região circundante a Lisboa. Este método de inquérito pré/pós-atividade permitiu aferir o nível de conhecimento e consciência ambiental adquirido pelos participantes com a realização destas atividades, ou seja, o impacto gerado. As atividades foram monitorizadas a fim de observar as técnicas e abordagens educativas utilizadas e relacioná-las com os impactos registados. Após a participação nas atividades, apenas 17% dos inquiridos adquiriu novos conhecimentos ou consciência acerca dos problemas ambientais, 16% adquiriram conhecimentos específicos sobre a flora desta área, 20% sobre a fauna e 12% sobre a importância ambiental dos locais visitados. Contudo, quase metade das pessoas inquiridas revelou ter uma incorreta noção dos seus conhecimentos, tanto antes das atividades como depois das atividades. Ainda assim, todos os participantes mostraram-se satisfeitos com as atividades. Os resultados demonstraram que os impactos positivos são dominantes no que se refere às atividades de turismo de Natureza amostradas. No entanto, e de um modo geral, as atividades não demonstraram possuir um desenho e plano de atividade plenamente eficaz e eficiente no alcance dos seus objetivos educativos. Estudos futuros poderão aprofundar o conhecimento acerca dos impactos que cada técnica e abordagem educativa gera, na perspetiva do participante, e dos mecanismos que convertem os impactos positivos em aprendizagens a longo-prazo. Poderá, ainda, ser interessante compreender e avaliar quais os vários fatores que contribuem para a satisfação dos participantes a fim de correlacionar o tipo de impacto gerado com o nível de satisfação. Poder-se-á sugerir a elaboração – para posterior implementação - de uma lista geral de boas-práticas, a seguir pelas entidades turísticas no planeamento e execução das atividades, e um modelo de desenho de atividade que contemple estes aspetos. Em Portugal, é necessário investir em atividades de turismo de Natureza mais dinâmicas e versáteis, melhorar as estruturas de apoio às atividades, aumentar a monitorização das zonas protegidas e atividades aí desenvolvidas, ter uma oferta de atividades mais prolongada e constante ao longo do ano e reforçar a promoção e divulgação desta oferta tanto a nível nacional, como internacional. O sucesso da educação ambiental é a chave para uma sociedade ativa, responsável e com consciência das questões ambientais e, portanto, para um desenvolvimento e gestão ambiental sustentáveis.

Palavras-Chave: Turismo de Natureza; Consciência ambiental; Avaliação de impactos; Educação ambiental; Desenvolvimento sustentável.

Resumo Alargado

Perante os problemas ambientais atuais é cada vez mais importante a formação de uma sociedade consciente e ativa nas questões ambientais, perpetuando um desenvolvimento e gestão ambiental sustentáveis. Assim, a educação ambiental toma um papel importante para fomentar na sociedade conhecimentos e práticas ambientais de cidadania consciente e responsável que visam um desenvolvimento sustentável assente na solidariedade intra- e inter-gerações. A educação ambiental é uma temática atualmente abordada nas cimeiras internacionais das mais diversas áreas – política, economia, cultura e ambiente – dada a sua influência e importância nos diversos setores da nossa sociedade. Um setor onde a educação ambiental está cada vez mais presente é no turismo de Natureza - um produto turístico que permite ao turista usufruir do património natural, cultural, arquitetónico e paisagístico, devendo-se desenvolver sem degradar estes valores, mas sim potenciando-os - praticando-se como educação ambiental não-formal, através de atividades que promovem o contacto com a Natureza, desenvolvidas por agentes de atividade turística, e com reconhecido potencial para a educação ambiental. Acredita-se que geram impactos positivos na perspetiva dos participantes, promovendo a alteração positiva de conhecimentos, consciência, atitudes e comportamentos e, consequentemente, a conservação da Natureza e desenvolvimento sustentável.

A nível Europeu o turismo de Natureza tem crescido de ano para ano dada a sua influência em diversas vertentes, desde a ambiental e educacional até à económica, social e cultural. O sucesso destes projetos de educação ambiental não só formou cidadãos mais interessados na temática, como também permitiu a maior divulgação dos projetos e da temática, culminando numa procura cada vez maior destas atividades. Além disto, para o sucesso e desenvolvimento adequado deste setor, são necessárias boas estruturas de apoio às atividades e características locais aliciantes. Em Portugal, apesar das inúmeras entidades turísticas operantes e das riquíssimas condições ambientais, sociais e culturais, o público-alvo abrangido ainda se cinge muito ao mercado nacional. Para as atividades de turismo de Natureza alcançarem eficientemente os seus objetivos é necessário existir um desenho bem concebido do ponto de vista da transmissão de conhecimentos e tendo em conta a satisfação dos participantes. Se a atividade não for adequada ao público-alvo e local onde decorre, pode acabar por não gerar impacto nos turistas ou gerar um impacto negativo.

Este estudo visa avaliar o impacto que as atividades de turismo de Natureza com intuito educativo, conduzidas por operadores turísticos, têm sobre os turistas no que respeita ao seu nível de conhecimentos e consciência ambiental. O estudo incidiu sobre atividades desenvolvidas por operadores turísticos que desenvolvem atividade na zona da Grande Lisboa, tendo a amostragem decorrido ao longo dos meses de Outubro de 2016 a Abril de 2017, baseando-se no acompanhamento e monitorização presencial das atividades e aplicação de inquéritos aos participantes, antes e depois de realizarem as atividades (inquéritos *a priori* e *a posteriori*, respetivamente). Através de questões colocadas aos participantes acerca do seu nível de conhecimentos e consciência ambiental, antes destes iniciarem as atividades – no inquérito *a priori* - e após terminarem as atividades – no inquérito *a posteriori* -, e comparando as respostas pré-atividade com as respostas pós-atividade foi possível averiguar se ocorria alteração dos conhecimentos e consciência ambiental dos participantes, depois de realizarem as atividades, e se esta alteração representava um impacto (1) positivo - aumento da consciência e conhecimentos ambientais corretos - ou (2) negativo - incorreta aquisição de conhecimentos -, ou se havia (3) ausência do mesmo - ausência de aquisição de novos conhecimentos e consciência e/ou '*inalteração*' dos anteriores. A monitorização das atividades permitiu associar os resultados obtidos nas atividades com as técnicas e

abordagens educativas utilizadas, de forma a perceber quais as mais eficientes na educação ambiental e satisfação dos participantes. No total, foram inquiridos 52 participantes, sendo que o número de participantes de cada género foi relativamente próximo. A maioria encontrava-se na faixa etária dos 40 – 65 anos de idade (não se registando nenhum entre os 15 – 20 anos) e tinha Licenciatura, não se destacando nenhuma área profissional em particular. A motivação principal, da maioria que realizou estas atividades, foi o relaxe, lazer ou fuga à rotina e tomou conhecimento das mesmas através da internet e/ou redes-sociais, não tendo ninguém recorrido aos postos de turismo.

Antes de participarem nas atividades, 90% dos inquiridos estava já consciente dos principais problemas ambientais globais e após terminarem as atividades só 17% adquiriu novos conhecimentos ou consciência acerca destes problemas. Quanto às particularidades dos locais, 16% dos participantes que não tinham conhecimentos prévios de flora passaram a ter depois da atividade, sendo o valor superior para a fauna (20%) e inferior para a importância ambiental dos locais onde decorreram as atividades (12%). Contudo, 42% dos que, antes de realizarem a atividade, afirmaram conhecer a importância ambiental dos locais estavam errados nesse aspeto e, após a atividade, 48% dos participantes continuava sem correta consciência e noção dos seus conhecimentos nesta questão. Entre os aspetos que revelaram maior percentagem de conhecimentos errados, ou falta deles, salientam-se a reintrodução de espécies extintas, a zona ser um *hotspot* de biodiversidade, a existência de espécies com estatuto especial de conservação e a tipologia de classificação da área visitada. Todos os inquiridos ficaram satisfeitos ou muito satisfeitos com as atividades e a sua principal sugestão foi a implementação de mais painéis interpretativos nos locais de atividade, além de um maior ajuste das atividades ao público presente. A maioria dos participantes referiu gostar de ter a oferta deste género de atividades principalmente na região Norte de Portugal e em Parques Naturais.

Estudos anteriores revelaram alguma discordância quanto à ocorrência ou não de impactos positivos nos conhecimentos e consciência ambiental dos turistas e no contributo destas atividades para a educação ambiental. Este estudo demonstrou existirem diferenças positivas significativas no nível de conhecimentos dos participantes quanto a temáticas de fauna. Contudo, muitos conhecimentos que estavam errados antes das atividades não foram alterados após as atividades, como também o número de participantes que mantinha desconhecimento sobre vários aspetos *a priori* continuou elevado após a atividade. A transmissão e aquisição incorreta de conhecimentos e a incapacidade destas atividades mudarem os conhecimentos incorretos dos participantes e consciencializarem-nos para o seu real conhecimento, denota a ineficiência destas no objetivo de educação ambiental. Um desenho mal concebido que não inclua as melhores técnicas e abordagens educativas poderá gerar isto. O desenho de uma atividade de turismo de Natureza é um ponto importante para o sucesso da mesma, mas também é importante o processo de elaboração do desenho e a sua monitorização e avaliação regular para reverter os impactos negativos e potenciar os positivos, aperfeiçoando-o. A interpretação ambiental, o carácter adaptável da atividade, a oferta de uma experiência marcante através da interação com a Natureza e da riqueza dos conteúdos ambientais transmitidos, a disponibilização desta informação durante e após a atividade, tal como o carácter interativo e dinâmico do guia, são aspetos essenciais a serem incluídos no desenho destas atividades, os quais poderão aumentar de forma significativa o seu sucesso. Neste estudo poucas atividades demonstraram ter uma capacidade adaptativa, sendo necessário, na opinião dos inquiridos, melhorar esta dimensão, tal como as estruturas de apoio às atividades que não se apresentam devidamente desenvolvidas e, sendo estas características necessárias ao bom desenvolvimento deste setor turístico e sucesso como ferramenta educativa, poderá justificar o insucesso destas atividades em certos impactos gerados.

O inexistente papel demonstrado pelos postos de turismo na divulgação e promoção destas atividades poderá explicar o reduzido alcance do turismo de Natureza português a público-alvo internacional e o reduzido conhecimento, por parte de alguns turistas, quanto à regulamentação vigente nestas zonas com valores naturais e culturais.

Em síntese, um maior investimento no processo de desenho das atividades de turismo de Natureza é sugerido, tal como a sua monitorização para potenciar os impactos positivos e mitigar os negativos. Em Portugal, é necessário investir em atividades de turismo de Natureza mais dinâmicas e adaptáveis ao público, melhorar as estruturas de apoio às atividades, investir na monitorização das zonas protegidas e atividades aí desenvolvidas, ter uma oferta de atividades mais prolongada e constante ao longo do ano e reforçar a promoção e divulgação desta oferta.

Estudos futuros poderão aprofundar a compreensão dos mecanismos, técnicas e abordagens educativas inerentes aos impactos positivos e à conversão destes em aprendizagens a longo-prazo. Seria importante continuar os estudos nesta área para melhor compreender o impacto destas atividades na educação ambiental e potenciar o seu sucesso. O sucesso destas atividades gera turistas mais educados e satisfeitos, logo, com maior interesse por este género de projetos e temática ambiental, construindo-se uma sociedade mais preocupada e ativa na gestão e sustentabilidade do Ambiente.

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Symbology and Abreviations

APA	Associação Portuguesa do Ambiente
UNRIC	United Nations Regional Information Centre
UN/ECE	The United Nations Economic Commission for Europe
EEDS	Strategy on Education for Sustainable Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
DGE	Direção-Geral da Educação
PNTN	Programa Nacional de Turismo de Natureza
UNWTO	World Tourism Organization
ICNF	Instituto da Conservação da Natureza e das Florestas
THR	Asesores en Turismo Hotelería y Recreación, S.A.
km	Kilometres
%	Percentage
vs.	Versus
α	Significant level
p-value	Measure of evidence
df	Degrees of freedom
χ	Chi-Square statistic test
W	Shapiro-Wilk statistic test
V	Wilcoxon-Mann-Whitney test statistic

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CHAPTER 1

General Introduction

Society´s growing interest and participation in issues directly or indirectly related to the environment (as like social and cultural aspects, and the economy and politics) urged the need to provide citizens with knowledge about their environment and the problems related, warning them of how to solve these problems and motivating them to work in the effective search of solutions (Stapp, 1997). Thus, the importance of environmental education arose to overcome the anthropocentric vision and to recognize the value of Nature, of which we are an integral and dependent part. The relevance of this matter have been growing due to the problems resulting from population exponential growth, urbanization, industrialization, deforestation, pollution, destruction of the ozone layer, global warming (Palmer, 1998), among others. Environmental education aims at fostering in society effective and efficient practices of conscious, responsible and active citizenship in order to achieve sustainable development based on intra / intergenerational solidarity (APA, 2017a).

Helping to raise in society the awareness that mankind is part of the environment, the environmental education adverts to the need for environmental protection, constituting citizens concerned and active in environmental problems solving, conservation and preservation of natural resources and sustainable environmental management. For an adequate environmental management (Quintas & Gualda, 1995) - a management that aims at the sustainability of natural resources as well as the balance with and between social, cultural, economic and political factors, as in a process of mediation of conflicts of interest (Layrargues, 1999) - it is necessary to build a society based on these values (Jacobi, 2003).

Environmental education is an interdisciplinary matter since it deals with everything from environmental ecology to policy, social and ethical aspects as a whole. According to Agência Portuguesa do Ambiente, APA (Portuguese Environmental Agency), *environmental education is currently understood in the broader context of sustainable development*. It is an essential pillar to sustainable development, as it contributes to the change of knowledge, values and behaviours by transversally integrating environmental objectives into the social and economic development sectors (APA, 2017a; Leff, 2011). It can be defined as the set of processes through which society and individuals construct social values, knowledge, attitudes and skills to conserve and preserve the environment and its resources, in a sustainable management. Thus, nowadays, environmental education plays an important role not only from the environmental point of view, in its wider sense - for the preservation, protection and sustainability of natural resources - , but also from the social, economic and political point of view - for the construction of a more educated, informed and participative society - given the relationship established with the exercise of conscious citizenship (Leonardi, 1997) and the growing need of citizens concerned and involved.

The concept of 'Environmental Education' initially had its focus on the Stockholm Conference (1972), where its strategical importance in preserving and improving the environment was emphasized and, at the Intergovernmental Conference on Environmental Education (1977), its guidelines were defined (Jacobi, 2003). Since then the subject has been officially included in the discussions of international organizations and currently the concerns, given the growing need to preserve the environment and promote intergenerational equity based on sustainable development, have been raised at international summits, which contributes to an increase in the scope of environmental awareness and results in more effective solutions, since the matter counts on the collaboration and involvement of several parties. In 2010, in Japan, the United Nations launched the "biodiversity decade" initiative (2011-2020), in which

it was stated the need of an increase in the biological diversity and it services provided, for a truly sustainable development (Azevedo Ferreira, 2015; UNRIC, 2017).

Portugal had the first impulse in this matter thanks to the protocol of cooperation established between the Ministries of Education and Environment, initiated in 1996 and reinforced in 2005 (Teixeira et al., 2014), which allowed the promotion and development of education in Portugal. Also in 2005, Portugal became a signatory to the UN/ECE Strategy on Education for Sustainable Development (EEDS) and the United Nations Decade of Education for Sustainable Development, developed by UNESCO (Instituto do Ambiente, 2005; Teixeira et al., 2014), giving a new force in the promotion of environmental education and the initiation of Portugal in environmental education projects for sustainable development (Instituto do Ambiente, 2005). All these elements contributed to the dissemination of innovative and dynamic practices in environmental education, extending the scope of the projects to a more general target audience.

Today, in the 21st century, it is intended with environmental education programs that citizens learn to use the knowledge transmitted to them to interpret, evaluate and interact with the surrounding reality, instigating concern for the environment and a change of attitude for a conscious, dynamic and informed citizenry about the environmental problems. It is intended to contribute to the development of capacities - to formulate, debate and sustain arguments and positions - essential for active participation in conscious and informed decision-making processes, facing the effects of human activities on the environment (DGE, 2016), promoting good environmental management. Environmental education should lead to the construction of values and the acquisition of knowledge, attitudes and skills that allow the responsible participation of citizens in environmental management (Layrargues, 1999). Thus, environmental education currently takes several forms to achieve this goal.

Contrary to what used to happen in the past, where environmental education was often practiced in a decontextualized and excessively theoretical way, aiming only at the incorporation of new knowledge about the environment and the threats posed by the human being, nowadays environmental education is a more practical and comprehensive discipline - linking diverse areas from the life and earth sciences to politics, economics, culture and society. There is a concern to foster public involvement through programs and activities that teach citizens to take a more active and correct position in decision-making (Leff, 2011; Tanner, 1978).

Currently the practice of environmental education assumes three main forms: informal, formal and non-formal. Informal environmental education occurs when, without purposeful education, the individual acquires knowledge of science through his own experience and episodes of life. There is no educator or educated present. Formal environmental education is the oldest form of teaching that it is developed within a classroom, in a teaching context, where the educator conveys the concepts to the learner. It is the most theoretical form of education and applies not only to environmental education but also to other disciplines. Finally, the means of education under which this study will be addressed is environmental education through non-formal education. This is done outside the school environment, with the intention of transmitting knowledge of science to a heterogeneous target audience (Chagas, 1993), through an educator or guide.

Non-formal environmental education is developed in the form of guided tours through parks, museums, indoor and outdoor interactive activities, among other events organized by institutions/operators linked to educational structures - environmental education centres and interpretation of protected areas, pedagogical farms, ecotecas, parks and environmental reserves - with the aim of communicating and teaching science. In this way, notions of ecology and environmental management are transmitted to society, in an interactive and effective way, as indispensable parts of a sustainable society. It is directed to any age and social group because environmental awareness and responsibility are important in all individuals.

In Portugal, non-formal environmental education is gaining more and more prominence. The growing number of institutions/operators working in this area - tourism operators, schools, local authorities, nongovernmental organizations and other local, regional and national entities -, its wide variety of offer and typology of activities and its greater reach of the target audience, all contributed so that the non-formal environmental education reached the level in which it is today. Furthermore, the success of these environmental education projects for sustainability has led to the dissemination of a greater level of information, creating educated citizens interested in the subject, which culminates in an increasing demand for this type of activities.

Nature-based tourism is a way for non-formal environmental education that is gaining constantly more adepts today. It is carried out by agents of tourism activities, detaining the Nature-based tourism license, and has a recognized potential for environmental education and Nature conservation (Neves & Mateus, 2015; Oliveira, 2013). According to Ruschmann (1997) in Nature-based tourism the tourist is invited to participate consciously in the protection of the environment (not only during the tourist activity but also in their quotidian). One of the objectives of Nature-based tourism should be the 'self-transformation' of the tourist with regard to their attitudes, behaviour and environmental values (Luo & Deng, 2008; Weaver & Lawton, 2002). In a study conducted in Australia, Lee & Moscardo (2008) conclude that Nature-based tourism activities can achieve its environmental education goals if there is a combination of two factors: satisfactory experiences for tourists and knowing about the existence of this environmental practices in-site. Another factor of great importance for Nature-based tourism to be successful as an environmental education tool is the need for a well-conceived interpretation provided during activities/events (Powell & Ham, 2008) in order to allow positive change of attitudes, behaviours, knowledge and awareness of the tourists.

Nowadays, Nature-based tourism has gained a high relevance given the increasing recognition of its potential in the promotion of diverse aspects, from environmental and educational to economic, social and cultural. Furthermore, due to the greater environmental awareness, the interest in Nature-based tourism activities that offer an authentic experience full of ethical values, the preference for non-mass tourism areas and the accessibility to information related to these activities (which covers more target audience, day-by-day) also contribute to a prosperity in this tourism sector. The demand for Nature-based tourism activities in Europe has grown at an average annual rate of around 7% and it is expected that this rate may even increase (AEP / Gabinete de Estudos, 2008). Portugal, although not currently the most sought-after European destination for Nature-based tourism, on a 10-year scale could achieve a 9% annual growth rate for this sector, according to a study conducted by THR (Advisors in Tourism Hotelería y Recreación, SA) for Turismo de Portugal, (THR (Asesores en Turismo Hotelería y Recreación S.A.), 2006). Here, in Portugal, Nature-based tourism with a strong environmental education

component attracts mainly two types of target audience: (1) tourists of advanced / frequent interest in Nature and (2) tourists of deep / usual interest in Nature. This first type represents about 15% of the total number of tourists seeking Nature-based tourism (there are other types of Nature-based tourism that do not primarily focus on education) and the second type represents around 10%, i.e. a total of 25%. In other words, one fourth of the total number of tourists who seek Nature-based tourism in Portugal, do it so in order to participate in Nature activities with an educational, informative and sensitizing environment. In the same THR study for Turismo de Portugal, I.P, these two types of Nature-based tourism are considered as having medium/high growth potential in Portugal.

However, in Portugal, the target audience reached with the Nature-based tourism offers remains mainly restricted to the national public, although the number of tourism entities operating in Portugal has been growing. This might be due to several aspects, like the lack of an efficient management of environmental protected zones and all the related intervenients. Schmidt et al. (2010) performed an analysis of the projects in environmental education and sustainable development panorama existing in Portugal. The conclusion reached by the authors is that there is a lack of a pedagogical model and a political education strategy that guarantee a permanent and strategic place for this matters, of environmental problems and sustainable development, in the educational process of citizens.

Deeping the studies about this subject achieving a better understanding of how Nature-based tourism activities can lead to a more effective environmental education, for a sustainable development, may provide the necessary tools for an efficient environmental management.

CHAPTER 2

The impact of Nature-based tourism activities promoted by tour operators on the environmental perception of visitors

2.1. Introduction

The Nature-based tourism is a type of tourism that offers tourists the opportunity to enjoy the natural, cultural, architectural and landscape heritage and it must be developed in a way that does not compromise the value of these sites' heritage (PNTN, 2015). Nature-based tourism may contribute to the conservation and promotion of the environment and its natural resources, from a perspective of sustainability (Oliveira, 2013). The World Tourism Organization has its relevance in this task since they promote the tourism as a "driver of economic growth, inclusive development and environmental sustainability", supporting and encouraging the practice of a tourism that enhances the positive impacts and mitigates the negative ones towards the environment and all the areas that this sector influences (UNWTO, 2017). According to Instituto de Conservação da Natureza e das Florestas, ICNF (Nature and Forest Conservation Institute), Nature-based tourism is defined as "the touristic activity that takes place in classified areas, or other with natural values", which is recognized as such by this Institute.

For the development of this tourism cluster there is a series of support structures that, as a whole, allow the tourist to enjoy Nature in a satisfactory way. The (1) ecotecas, environmental parks and reserves and a series of other places where Nature-based tourism takes place, the (2) tourist entities that offer a vast program of activities of Nature-based tourism and environmental animation, the (3) tourist office, which provides the necessary information about places and activities of Nature-based tourism existing in the region, the (4) interpretation infrastructures (interpretive centres or panels) in the tourist site and, at least, the (5) support infrastructures for tourists (bathrooms and rest areas) and accommodation, also the (6) good accessibility to touristic sites is a key feature to promote tourist enjoyment (THR for Turismo de Portugal IP 2008; Associação Empresarial Portuguesa 2008). In addition to these structures, it is necessary to have on-site features that encourage the exploration of the natural side of the areas, this is, a diversity of natural resources such as varied landscapes, natural habitats and biodiversity, fauna and flora found there.

The search for activities of interaction and fruition of Nature and environment and, simultaneously, with high symbolic and ethical value, have led this tourism sector to gain the relevance it has today. At global level, Nature-based tourism is expected to grow from around 7% of global tourism, in 2007, to 25%, by 2020 (Ardoin et al., 2015). In Portugal, the enormous diversity of natural resources, the high percentage of protected natural areas and classified Areas - 21%, according to ICNF -, the favourable weather conditions, country's security and the hospitality, are factors that play an important role to the national development of this sector, that has more relevance in the autonomous regions of Azores and Madeira, and walks towards an average annual growth rate of 9% (AEP / Gabinete de Estudos, 2008). According to a study conducted in 2006 about the evolution and perspectives for Nature-based tourism practiced in Portugal, 6% of the tourists who visited Portugal did it with the main purpose of practicing Nature-based tourism (F. A. D. S. Da Silva, 2013; THR (Asesores en Turismo Hotelería y Recreación S.A.), 2006).

Nature-based tourism can serve different purposes, from the simplest interest in contemplating Nature to the deepest interest in Nature, as well as the interest in practicing sports activities developed in natural environments. These various types of activities allow the covering of a wide range of individuals'

interests. Depending on the type of activity and profile of the tourist, Nature-based tourism can be divided into two categories of market: (1) soft Nature-based tourism and (2) hard Nature-based tourism. The first category is characterized, as the name implies, by a set of activities of low intensity, practiced outdoors - hiking, excursions, observation of fauna and flora, boat or jeep tours, among others - and the second category represents the set of activities of greater intensity, such as Nature sports - hiking, climbing, rafting, canoeing, costering, mountain biking, among others - and those that require a high degree of concentration / knowledge - birdwatching. In one hand, this last category requires a major investment by the tourist, given the level of specialization of the activities and equipment needed (Weaver & Lawton, 2002) but, on the other hand, in Portugal, is the soft Nature-based tourism that counts with a greater representation in terms of demand (80% of the total demand for Nature-based tourism) and greater perspective of growth given the characteristics of the country (THR for Turismo de Portugal IP 2008).

However, in Portugal, despite the wide range of tourism programs and activities offered, the extent of these at European level is small and has little expressiveness abroad, with the majority of the target audience reaching only citizens residing in the country. This may be due to the lack of regulation, control and support that this type of activities and entities that promote them received from responsible regulatory agencies and, also, because of the precarious management of Classified Areas' territory. In 2015, according to the National Register of Agents of Tourism Animation, about 500 tourism entities were registered and operating in Portugal but, despite this high number and the rich territory of Classified Areas existing, the operation' regulation of these agents in these Portuguese areas is not efficiently articulated, generating problems that reflects in a precarious dissemination of Portuguese Nature-based tourism at the international level. There is no practical and efficient management of the protected environmental zones, there is a lack of monitorization of these areas and the uses and activities developed there, the information and regulation concerning these areas is not properly diffused among citizens nor is the necessary support given to the tourism entities that, according to Budeanu (1999) and Powell & Ham (2008), could help to promote a sustainable Nature-based tourism, contributing to a greater success in the monitorization, preservation and protection of these areas, a more effective management of protected environmental zones and reaching the international target audience.

The influence of Nature-based tourism extends to various areas such as economic, political, social, cultural and, of course, environmental (A. R. V. R. da Silva, 2012; Wilson & Tisdell, 2003) and it is often promoted as an asset for the regions where it is developed, believing to have a positive impact on the local socio-economy and promoting direct support for conservation/protection of natural and cultural values (Ardoin et al., 2015). The outcomes of these related activities, with the purpose of environmental education, when well-conceived can be diverse but all of them important to our society, having the potential to generate a positive impact on the tourist – like acquisition of environmental knowledge/awareness, and behaviour and attitudes' change – and promoting citizens' responsibility and interest in the environment and inherent issues, perpetuating sustainable development (APA, 2017a; Layrargues, 1999; Luo & Deng, 2008; Marion & Reid, 2007; Mayes, 2009; Neves & Mateus, 2015; Powell & Ham, 2008; Ruschmann, 1999; Weaver & Lawton, 2002). However, any register change in: (1) knowledge, (2) awareness, (3) behaviour, (4) attitude, (5) capabilities, (6) experience, (7) practice or (8) change in communities, ecosystems, and ecosystem services, resulting from the citizens' engage in this type of activities, is considered as an impact of the activities (Byron et al., 2014), whether it represents a positive impact - i.e. correct and valuable acquisition of environmental knowledge - or a negative one. It is not guaranteed to always generate positive impacts, although this is their intention. If

Nature-based tourism activities are not well conceived, they can generate a sense of dissatisfaction experienced by the tourists - reducing the likelihood of new engagement by them in this type of activities and in the environmental issues (Ardoin et al., 2015) – and also, fail to transmit correct environmental knowledge and concepts, conveying the wrong message to the tourists. Any of these situations presents a threat to the purpose of these activities, as it may translate into an absence of impact on the tourist or only generating a negative impact (Luo & Deng, 2008; Powell & Ham, 2008). Moreover, it is difficult to know how the positive impacts generated over the tourists extend and evolve once they return home and to his daily life. But, it is known that even small positive impacts in knowledge, awareness, attitudes and behaviours resulting from involvement in these activities can result in a substantial and sustained impact on global sustainability (Ardoin et al., 2015).

The impact of Nature-based tourism activities, concerning environmental education, on tourists' behaviours, attitudes, knowledge and environmental awareness, has been long studied in the last decades, such as Luo & Deng (2008) and Rickinson (2001) exposes. However, the data on this subject are somewhat mixed. On one hand, studies have shown that there is no positive (or very low) impact of these activities on tourists' knowledge and environmental awareness but, on the other hand, these activities are often associated with citizens' knowledge acquisition but not associated with behaviour and attitudes' change (Powell & Ham, 2008). This is, theoretically they do have a positive impact on environmental awareness and knowledge and no impact on attitudes/behaviours (Powell & Ham, 2008). Like the present study, Lee & Moscardo (2008) studied the changes occurred in the tourists' awareness and environmental knowledge, attitudes and behavioural intentions, before and after they engaged in Nature-based tourism activities, and revealed significant effects on visitors' perception, their involvement in environmental management practices and a will to engage in activities related to Nature.

In order to evaluate the impact of these activities in tourists' behaviour and attitudes, some studies correlate the intention of the tourist - who often, after a satisfactory and emotionally involving activity, shows high intention to positively change their behaviours/attitudes - with the real positive change in behaviour/attitudes but, according to Hughes (2012), this correlation can lead to mistakes since the initial intentions, in the majority of the cases, does not translate in real behaviour' or attitude' changes at a long term (Hughes, 2013). Thereby, despite the various studies that already exists about this matter, it is important to keep studying it, aiming a better understanding of the effects that Nature-based tourism activities have on environmental awareness and education, for a sustainable development, allowing the improvement of these activities in order to enhance the expected positive impacts, constituting a more effective tool in environmental education. Also, beside the arguments that Nature-based tourism activities have the potential to promote a better understanding, knowledge, positive change of behaviours/attitudes and awareness about the environment and natural resources (Luo & Deng, 2008; Neves & Mateus, 2015; Ruschmann, 1999; Weaver & Lawton, 2002; Zeppel & Muloin, 2008), there are still few studies that corroborate and test these facts in practice (Ardoin et al., 2015; Powell & Ham, 2008). Likewise, the relationship between the tourism operational characteristics and technics used and it positive changes generated in environmental knowledge, attitudes and behaviour is still under-explored (Budeanu, 2000; Weiler & Ham, 2001).

This study aims to understand the impact that environmental activities, conducted by tourist entities, have on tourists concerning to their level of knowledge, environmental awareness and interest in environmental causes and activities. The purpose of this study is to investigate whether the Nature-based

tourism activities carried out in Portugal are effective in transmitting environmental knowledge and concepts and in the environmental awareness of the tourists, through the observation and monitoring of activities and surveys applied to the participants of these activities, prior to and after the activities. This way, we intend to answer the following main question: (1) Are Nature-based tourism activities effective in transmitting knowledge and environmental awareness? And more specifically, (2) do participants in these activities adequately retain the information transmitted to them? (3) Is there a positive change in the participants' environmental awareness? (4) And, have the techniques and approaches used for the transmission of environmental concepts and knowledge been effective?

2.2. Methodology

2.2.1 Study area and tourism companies

Collaboration was recruited from several tour operators companies operating in a 100 km radius around Lisbon, in order to obtain some diversity as to (1) the characteristics of the place where Nature-based tourism activities take place - since, depending on the location, the natural resources and activities able to be carried out may differ -, and (2) typology of activities developed - since each tourist company follows its own visiting patterns and ideologies - and the three participants that integrate these activities - once the tourism company characteristics, the activities they offer and the places where they are carried out, may restrict the type of participants who seek them (even though they are mostly activities designed for a general and heterogeneous target audience). Thus, it was possible to obtain data with representativeness of the diversity of offer existing in Nature-based tourism with an environmental education aim, in Portugal, and reach the various segments of target audience that seek these activities.

Specifically, in the study area were selected tourism companies that operate in the Nature-based tourism sector focused on environmental education and for sustainability. From the range of activities offered by these companies, we only stick to those designed to transmit knowledge, concepts and environmental awareness - for example: walking tours, boat trips, visits to places recognized for their natural and cultural heritage - rather than sports Nature activities, for example, whose main objective is the practice of sport and not the transmission of some environmental knowledge.

2.2.2 Monitored activities and Sampling

The final choice of which activities would be accompanied, and in which the participant surveys were to be carried out - in order to assess the efficiency of these activities in the study parameters - was done at a random basis from the set of activities previously selected. Therefore, seven activities offered by three different companies were monitored and sampled. Each of the three companies had different types of activities but all of them designed to transmit knowledge, concepts and environmental awareness. One of the companies offered activities consisting in walking tours through the Nature and focused in the cultural and natural values of the sites demanding low physical effort from the participants - simple and easy tours among the Nature -, other company also offered walking tours through Nature but focused mainly in the natural values and demanding a higher physical effort – sometimes facing high slopes was necessary -, and the last company offered activities consisting in boat trips focused on the natural values of the site and offering resting time to the participants without any physical effort required.

Sampling was done using surveys, as seen in similar studies that focus on this topic such as Priskin (2003), Lee & Moscardo (2008), Powell & Ham (2008) and White & Jacobson (2010). In order to obtain data with the greatest possible variability and representativeness, all Portuguese participants present in the Nature-based tourism activities monitored and accompanied, regardless of social class or age group, were interviewed. The target audience, therefore, was heterogeneous and diversified, trying to obtain a representative sample of the Portuguese people. This sampling took place from October 2016 until April 2017 and a total of 52 participants were interviewed.

2.2.3 Inquiries

The method of applying participant surveys consisted of two phases during each activity: each participant was given (1) a first survey before they engaged in the activity - *a priori* inquiry - and (2) a second survey after the end of the activity - *a posteriori* inquiry. Thus, each participant answered two surveys (before and after participating in the activity) in order to compare the initial level of knowledge and environmental awareness (*a priori* of the activity) with the knowledge and environmental awareness with which these participants finish (*a posteriori* of the activity). This before-and-after survey method allows us to verify if there has been a new acquisition of knowledge, concepts and environmental awareness resulting from the participation of individuals in Nature-based tourism activities. Other authors used this same method to evaluate the impacts, from participants' perspective, of Nature-based tourism activities and claimed to performed well (Lee & Moscardo, 2005; Powell & Ham, 2008).

The inquiries were distributed by the Portuguese participants and consisted of anonymous questionnaires with a multiple-choice basis and with only a few short-answer questions.

The ***a priori* inquiry** (appendix 1) was subdivided into three parts:

(1) Basic characterization of the participant, where it was intended to collect basic information – gender, age group, level of education and professional activity - about the participant;

(2) Participant profile, where it was intended to draw the profile of the participant regarding to their preferences and choices related to Nature-based tourism activities. According to THR for Turismo de Portugal, I.P., (2008) when looking for the main motivation of the tourist and his profile there are five main categories of Nature-based tourism demands that can be distinguished: (1) rest and relaxation in Nature, (2) basic / occasional interest in Nature, where the main motivation is not the Nature itself, but this can become a factor of added value, (3) advanced / frequent interest in Nature, where Nature is one of the main motivations but one seeks to complement with other attractions of the destination and there is a need for a comfortable and safe stay, (4) deep / habitual interest in Nature, where Nature is the main motivation for purposes of learning, aesthetic pleasure, research, ethical commitment and (5) to practice adventure sports in Nature, where the main reason is to practice their favourite sports and the Nature represents the most appropriate scenario. Taking this in account, three different options were given to respondents when asked about their main motivation to engaged in this kind of activities: topic (1), topic (5) and summarizing topics (2), (3) and (4) in “Interest in the environment, animals, plants and natural/cultural heritage”.

Also, to complete the respondent’s profile, they were asked about how they became aware of these activities;

(3) Preliminary knowledge, where it was intended to gauge the environmental notions and knowledge that the participant has beforehand, using simple multiple choice or short answer questions about today's environmental problems, the site’ existing flora and fauna and its environmental importance.

The ***a posteriori* inquiry** (appendix 2) was subdivided into two parts:

(1) *A posteriori* knowledge, where it was intended to know if there has been any positive change in the environmental knowledge, concepts and awareness of the participant, by comparing the answers given here with the answers obtained in the "Preliminary knowledge" questions' section. Here the same questions were asked as in the "Preliminary knowledge" questions' section, but with different order of appearance.

As seen in previous studies, this method of comparison to assess the differences between participants' awareness / knowledge, *a priori* and *a posteriori* to the activity - where the questions asked in the previous inquiry are the same as those requested in the *a posteriori* inquiry, but with a different order - is reliable (Gutierrez de White & K. Jacobson, 1994);

(2) Participant opinion, where it was finally sought to ascertain the level of participants' satisfaction with the activity performance, which aspects were considered by them the most positive ones and which were considered negative, what do they suggest to activity improvements and what other sites would they like to see with this kind of Nature-based tourism activities offering.

The application of *a priori* and *a posteriori* surveys enabled the comparison of participants' level of knowledge before and after carrying out the activities of Nature-based tourism and, thus, allowed the assessment whether there was a correct acquisition of new knowledge and environmental concepts with these activities. Likewise, it made it possible to gauge whether there was a positive change in the participants' environmental awareness. The monitoring and observation of the activities of Nature-based tourism, conducted by the tour operators, allowed to evaluate which techniques and approaches were used for the transmission of environmental concepts and knowledge. Thus, depending on the results obtained from the surveys and relating these results to the techniques and approaches observed, it was possible to ascertain which techniques and approaches were most effective in transmitting knowledge and concepts and which have not been so successful.

2.2.4 Statistical analyses

In order to determine if there was a significant difference between the total of correct and incorrect answers, given *a posteriori* the activities, a chi-squared test was performed. This test procedure was applied in order to evaluate results relative to three main topics: local fauna, local flora and site' importance at an environmental level. Whenever the null hypothesis was rejected, the partition of the chi-square statistics was calculated, in order to identify the topics responsible for the significant differences. To determine if the mean number of correct answers was changed after the activities, a paired Wilcoxon test was conducted, after previous assessing non-normality of data using the Shapiro-Wilk test. All statistical analyses were performed using R (R Core Team, 2016) and a significance level of 0.05 was considered in all test procedures.

2.3. Results

2.3.1 Participants basic characterization and profile

The basic characterization of 52 respondents who carried out the Nature-based tourism activities monitored - gender, age, level of education and profession - is summarized in table 2.1. There was not a large difference between the number of male participants and the number of female participants who performed these activities. As for the age group, more than half of the participants were between the ages of 40 and 65 (57.7% of the respondent population) and there were no participants between 15 and 20 years of age. Also, only 1 individual was registered with less than 10 years of age. Approximately 38% of the surveyed population had a Bachelors degree, 17% a Master degree, and 25.0% high school educational qualifications. With regard to the professional activity exercised by the participants, there is no craft that stands out from the rest. It is only possible to denote that there were no registered participants working in communication areas and none who were unemployed.

Table 2.1 - General characterization (gender, age group, educational qualifications and occupation) of the interviewed participants undertaking the Nature-based tourism activities monitored.

Gender	
Male	44,23%
Female	55,77%
Age Group	
<10	1,92%
10 - 14	9,62%
15 - 20	0,00%
21 - 25	3,85%
26 - 39	17,31%
40 - 50	30,77%
51 - 65	26,92%
>65	9,62%
Educational Qualifications	
Less than Basic Education	1,92%
Basic Education	7,69%
High school	25,00%
Graduation	38,46%
Master Degree	17,31%
PhD	1,92%
Technical Higher Education	7,69%
Occupation	
Life and Health Sciences	5,77%
Earth and Environment Sciences	1,92%
Social and Human Sciences	13,46%
Engineering	13,46%
Computer and Electronics	7,69%
Business Science	1,92%
Economics and Management	3,85%
Communication	0,00%
Tourism	11,54%
Arts and Literacy	7,69%
Advocacy and Law	7,69%
Administration and Secretariat	5,77%
Logistics	5,77%
Student	13,46%
Unemployed	0,00%

Most of the participants who performed theses Nature-based tourism activities did it so for leisure reasons, to relax and/or escape the routine. Only 37% (approximately) did it because they had interest in the environment, animals, plants and natural/cultural heritage and ca. 19% did it aiming to perform recreational activities and exercise.

The two main activities' promoting means consulted by the participants who sought this type of activity and through which they learned about it were the internet and/or social networks (excluding the company's own website) and through someone else - approximately 27% and 25%, respectively. The company's own website was only used by approximately 19% of the participants. No participant used the tourist office to learn about the existence of these activities (figure 2.1).

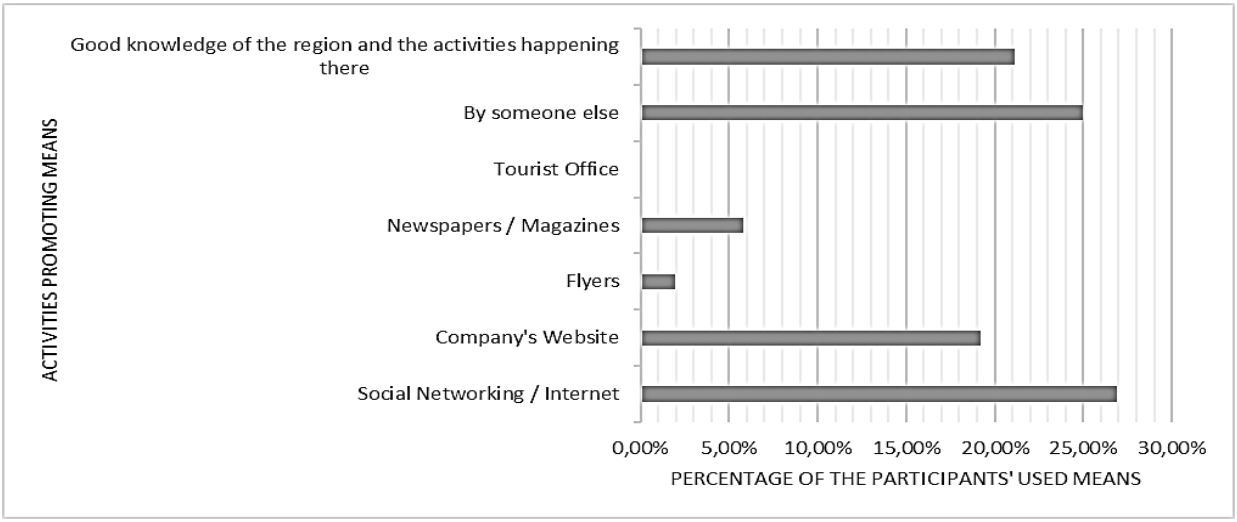

Figure 2.1 – Activities promoting means through which participants learned about the Nature-based tourism activities.

2.3.2 Before and after environmental knowledge and awareness

Through the analysis of the obtained answers in both the *a priori* and *a posteriori* surveys, regarding the "Preliminary knowledge" and "*A posteriori* knowledge" sections, an augment in the total of correct answers given *a posteriori* was noticed when compared to the total of correct answers given *a priori*, which the statistic Wilcoxon nonparametric test revealed to be a significant difference ($V = 1081$; p-value < 0.05) – since the data' distribution was not normal, according to the statistic Shapiro-Wilk test ($W = 0.8699$; p-value < 0.05 / $W = 0.8415$; p-value < 0.05), this nonparametric statistical test had to be performed. The average of correct answers given by each participant increased from 1.462 *a priori* to 1.923 *a posteriori*. Looking to the *a posteriori* scenario and comparing the total of correct answers with the total of incorrect ones, regarding the questions about the three main categories – fauna, flora and sites' environmental importance -, the differences observed between these totals revealed to be positively significant by the statistic chi-square test ($\chi = 14.43$; $df = 2$; p-value < 0.05), in other words, post-activity there were more correct answers than incorrect ones. Also with the partition of chi-square test these statistical differences revealed to be caused by the correct answers given in the fauna category.

Regarding the environmental awareness of the participants, before carrying out the monitored Nature-based tourism activities, and their knowledge about the environmental problems currently faced, the vast majority (90.0% of the respondents) were already aware and knowledgeable of these environmental

problems and only 10.0% of the population surveyed said they did not know about the environmental problems. However, after carrying out these activities, when asked about the contribution that these activities had had to acquiring new knowledge about the environmental problems or consolidating previous knowledge about this subject, the overwhelming majority of the participants stated that they had not acquired or consolidated knowledge/awareness about the environmental problems.

As for the participants' knowledge about the flora existing in the different places where the monitored activities took place, there was an increase of 16.0% of the participants who initially had no knowledge about the flora and after the activities of Nature-based tourism started to have - totalizing a value of 56.0% of participants who at the end of the activities already had knowledge about the flora. Likewise, the percentage of participants who had previous knowledge about the fauna existing in the areas where the monitored activities took place, increased by 20.0% after they complete the activities - totalizing a value of 85.0% of participants with knowledge about the fauna after the activities. In both cases, the percentage of participants initially lacking knowledge of flora and/or fauna decreased after they undergo on these activities - from 60.0% to 44.0% in the case of knowledge about flora and from 35.0% to 15.0% in the case of knowledge about fauna.

Regarding the participants' level of knowledge about the environmental importance of the places where Nature-based tourism activities took place, there was a 12.0% increase of participants who initially stated that they did not know the environmental importance of the places where they carried out the activities and later, after the activities, already claimed knowing it (figure 2.2). Thus, before the activities 40.0% of the participants affirmed knowing the environmental importance of the places and after the activities already 52.0% of the participants affirmed it. However, looking at figure 2.3, it is clear that of these 40.0% who prior to the activities stated that they knew this subject, only about 23% of them correctly knew the environmental importance of the sites. That is, almost half (approximately 42%) of the universe of participants who claimed to know this matter after all was wrong about what they thought the environmental importance of the sites was. In the *a posteriori* scenario (graphs on the right side of figures 2.2 and 2.3) the situation is similar since there were participants who stated that they correctly knew the environmental importance of the sites and that, after an analysis of their detailed answers, it was verified that they did not know. After completing the activities, 52.0% of the participants stated that they knew the environmental importance of the sites, but about 25% of them were wrong about the matter - again, almost half (48.0%) of the universe of participants who claimed to know.

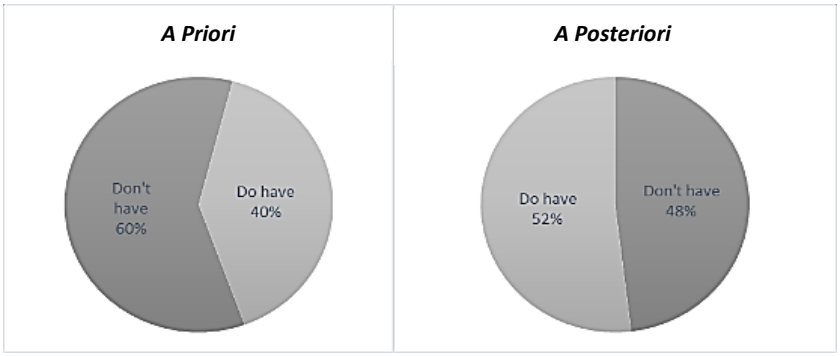

Figure 2.2 - Alleged knowledge of the participants about the environmental importance of the site. The left graphic shows the previous alleged knowledge of participants and the right-side graphic shows the alleged knowledge after the activity.

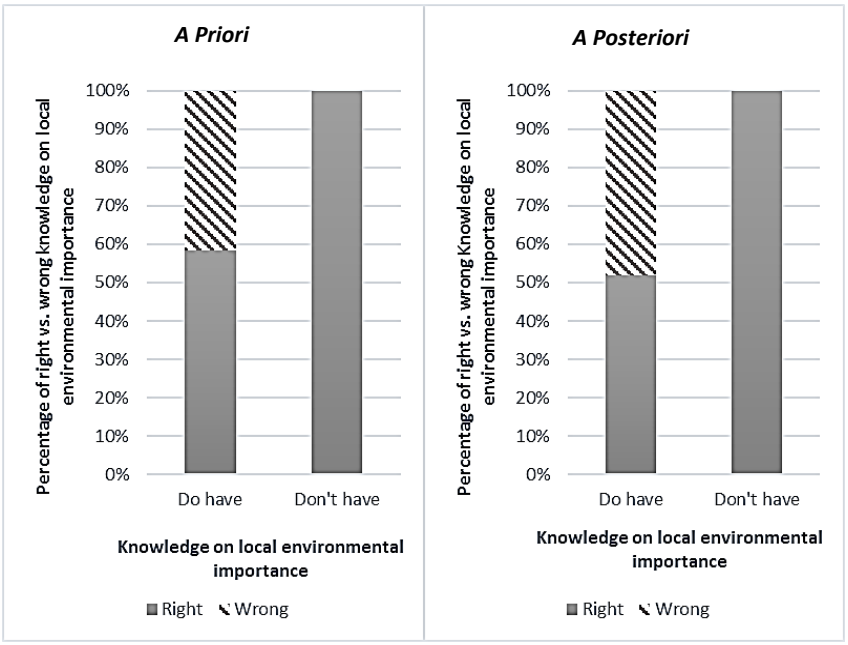

Figure 2.3 - Effective knowledge of the participants about the environmental importance of the site. The left graphic shows the previous knowledge and the graphic at the right side shows the knowledge after the activity. The left column, of both graphics, shows the percentage of participants who correctly stated that they knew the environmental importance of the site (solid filling) and who wrongly affirmed to know the environmental importance of the site (pattern like filling).

When asked, before and after the activities, about the environmental importance of the sites - and given different categorical options of possible environmental importance of these sites, in order to choose the correct options for the sites where they performed the activities - the participants did not show a significant change of their consciousness and knowledge, on this matter, after carrying out the activities. The *a posteriori* pattern of knowledge about the environmental importance of the sites is very similar, as can be seen in figure 2.4. It should be noted that no sites where Nature-based tourism activities took place represented a biodiversity hotspot or place for the reintroduction of extinct species, yet a large percentage of participants stated that these were correct options both before and after participating in activities – approximately 37% and 33% respectively. Another aspect to emphasize is the totality of correct answers regarding the importance of the places where the activities were carried out to promote the sustainability of ecosystems, that is, in all the places where this characteristic was present the participants were able to indicate it correctly.

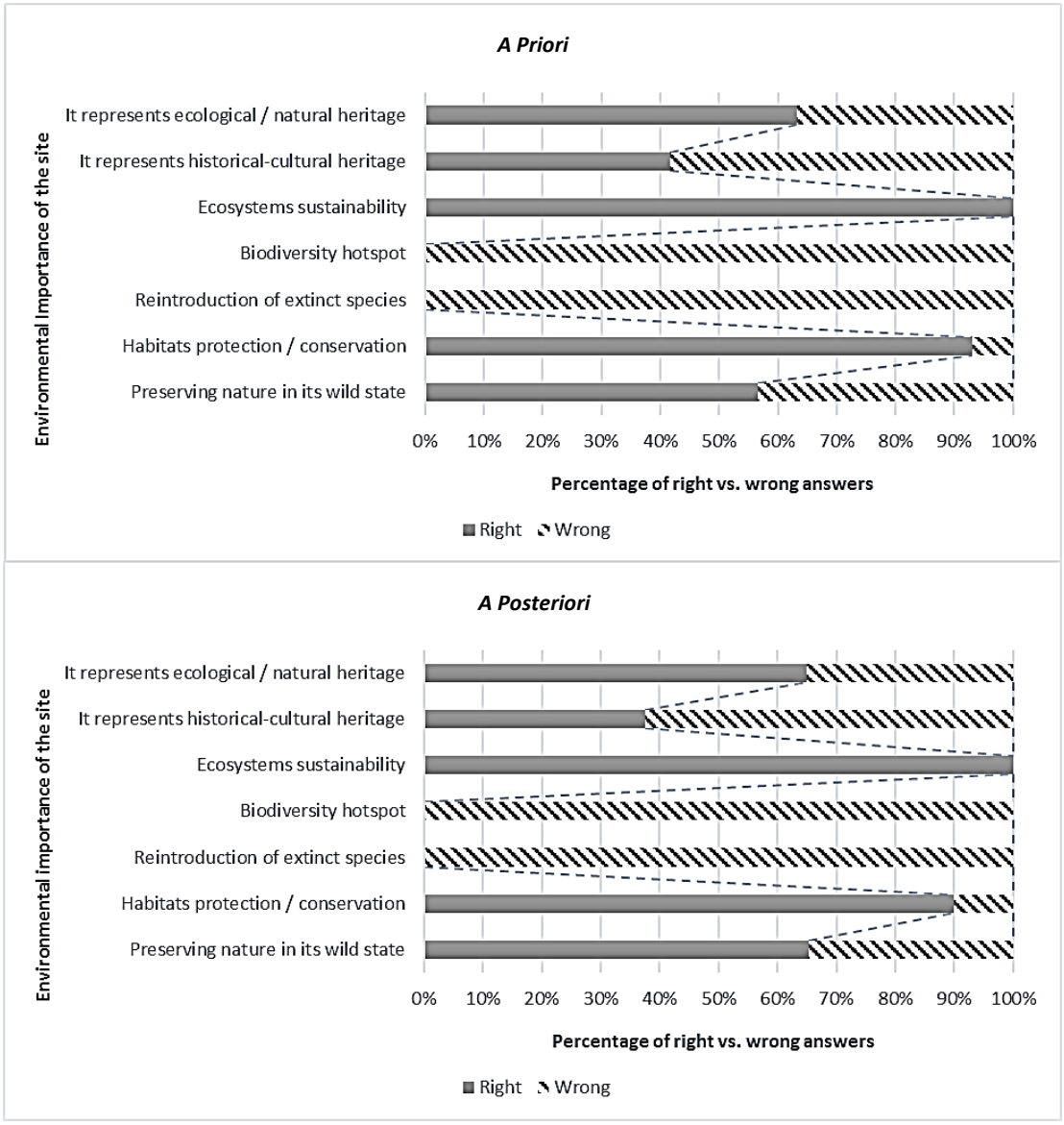

Figure 2.4 - Participants' awareness of the environmental importance of the site. Each column corresponds to a possible category of environmental importance of the sites where the activities of Nature based tourism took place. In each column is visible the percentage of participants who correctly considered the corresponding category as the correct local environmental importance (solid filling) and the percentage of who considered it wrongly (pattern like filling). The left side graphic shows the answers given before the activities and the right-side graphic shows the participant's answers after the activities.

As for the participants' awareness of the typology of sites, at the environmental level - i.e. whether the sites were Protected Area, Natural Reserve or Natural Park - the vast majority of participants demonstrated correct knowledge and awareness about this issue. It should be noted that some activities were conducted in places that did not represent neither Protected Area, or Park or Nature Reserve, so - in figure 2.5 - this correspondent option ("None of the options") was only selected by the individuals who participated in these specific activities, which resulted in a total of correct answers regarding this option. The "I do not know" option was considered correct in any case since it reveals the clear awareness of the participants about their own knowledge. Only about 2% of all respondents were mistaken in stating that the sites in question were Protected Area (this is, in approximately 17% of cases where it was claimed that sites were Protected Areas, they were not). In the same way, approximately 6% of the total respondents were wrong to say that the sites in question were Natural Park. Thus, of the total of respondents, only about 8% missed the question of "What is the environmental typology of sites" and 17.0% of respondents affirmed they did not know the typology of the sites.

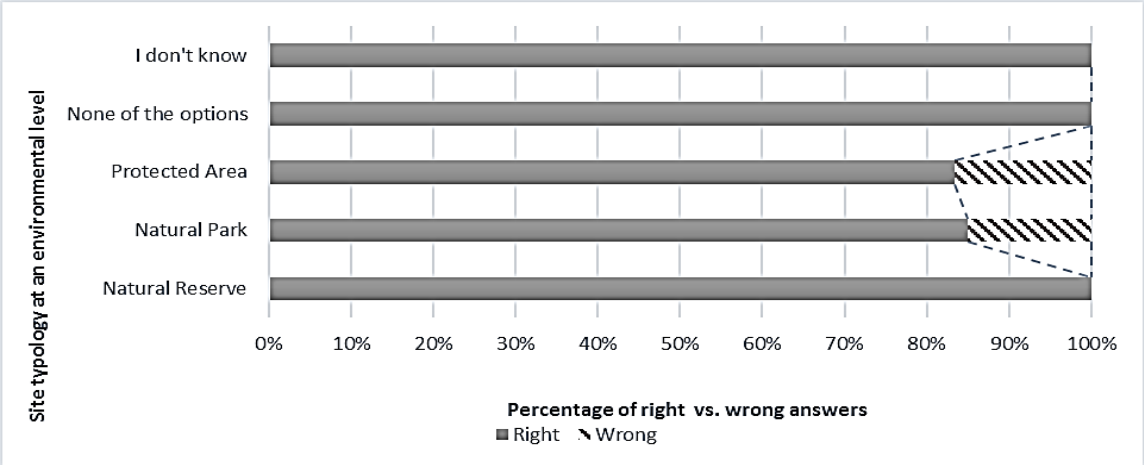

Figure 2.5 - Participants' awareness, after the activities, about the site typologies (at an environmental level) where these occurred. Each column corresponds to a possible site typology. In each column is shown the percentage of participants who correctly selected the site typology (solid filling) and the percentage of those who selected it incorrectly (pattern like filling).

Regarding the participants' perception of the existence of species with a special conservation status, at the places where Nature-based tourism activities were conducted – figure 2.6 - only 31.0% of the respondents knew that there were no species with a special conservation status in any of the places where these activities occurred. As can be seen in figure 2.6, 48.0% of respondents stated that they did not know how to answer the question and 21.0% incorrectly stated that these species existed in the places frequented.

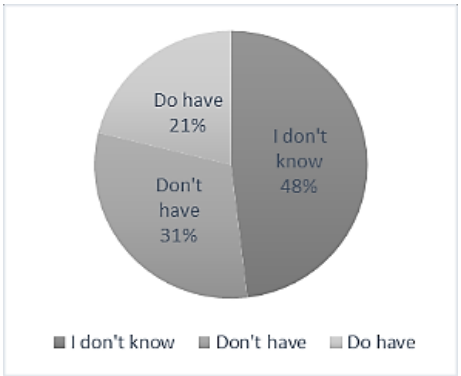

Figure 2.6 - Participants' perception after the activities about the possible occurrence, in the activities' sites, of some species with special conservation status.

2.3.3 Participants satisfaction and their opinion after the activities

After the activities were carried out, the participants were asked about their satisfaction with the performance of the activities, and all participants were very satisfied (approximately 54%) or satisfied (46% approximately) with the Nature-based tourism activities in which they participated. Also, although there were no unsatisfied or very unsatisfied participants with the Nature-based tourism activities undertaken, each one of the participants was asked to suggest a possible change in the structure of the activities carried out in order to try to promote their improvement. Looking at figure 2.7, a suggestion is mainly made: "Interpretative panels along the routes" with about 23% of the respondents suggesting this point. Another point that has a large percentage of supporters is the "Adjusting the activities to the present public (children/adults /seniors)" representing approximately 15% of the respondents' suggestions. Other important suggestions were pointed out by the participants - which can be read in figure 2.7 - but with less popularity among them.

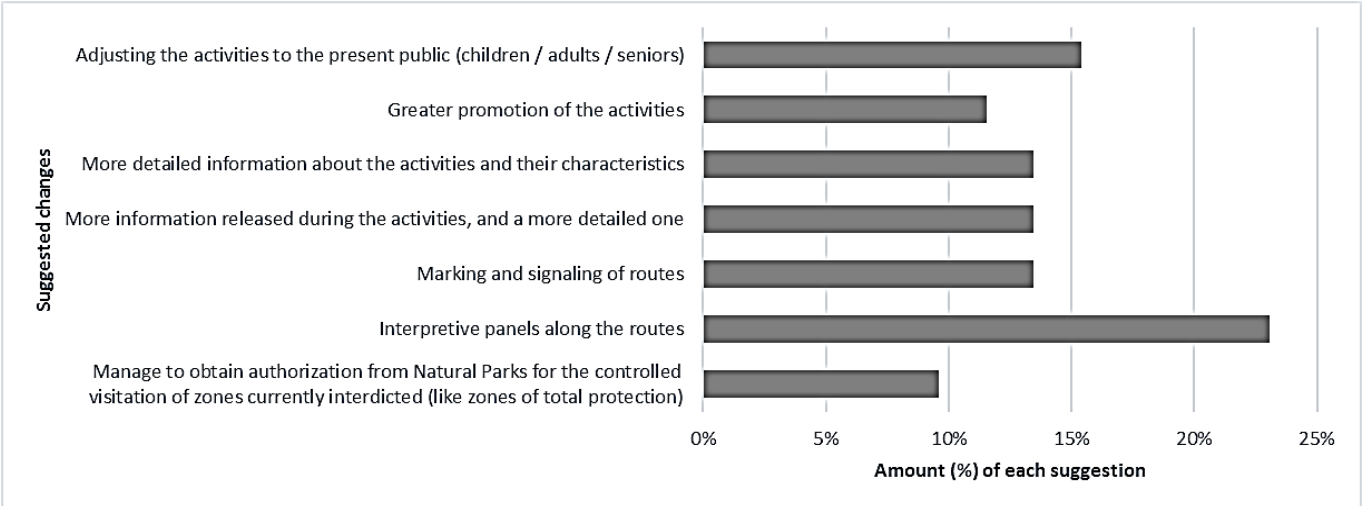

Figure 2.7 - Participants' suggested changes in the Nature based tourism activities carried out.

As for other places where participants would like to be offered with this kind of Nature-based tourism activities, the results obtained were organized in two graphs: one referring to the Geographical Regions of Portugal - figure 2.8 - and another one referring to the zones / areas with specific environmental characteristics - figure 2.9 - regardless of the Geographic Region of the country. The majority of the participants mentioned the Northern Region of Portugal (50.0% of the participants) as the place where they would like to carry out this type of activities, of which the majority (approximately 59%) specified a place in this Region where they would like to do this type activities - about 38% of participants who referred to the North as their preferred location specified that it would be in the Douro river region. There were no references to the Central Region of Portugal and only about 7% mentioned the Algarve Region as a place where they would like to be able to carry out this kind of Nature-based tourism activities. Figure 2.9 shows that the vast majority (approximately 33%) of the participants indicated that they would like to be able to carry out this type of Nature-based tourism activities in Natural Parks and about 21% of participants indicated "Areas with little human intervention, helping to preserve the site" as the zones / areas where they would like to be able to carry out these activities.

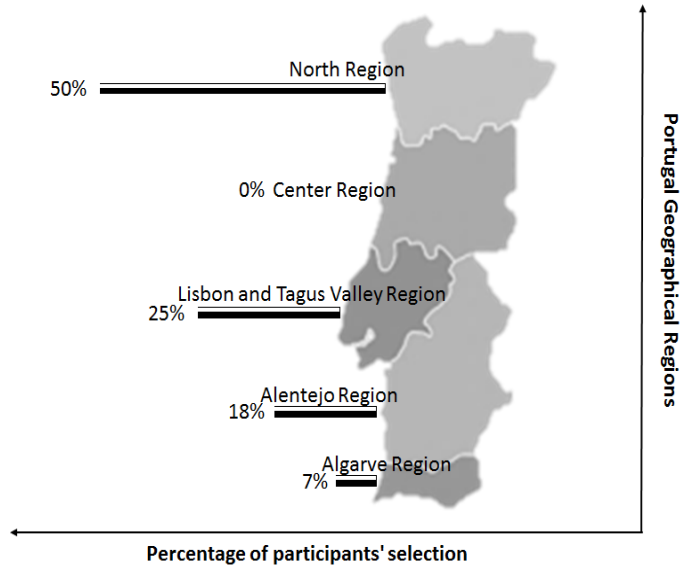

Figure 2.8 - Participants' selection of the places in which they would like to have this kind of Nature-based tourism activities. The places suggested by the participants were organized by the Portugal Geographical Regions (North, Center, Lisbon and Tagus Valley, Alentejo and Algarve).

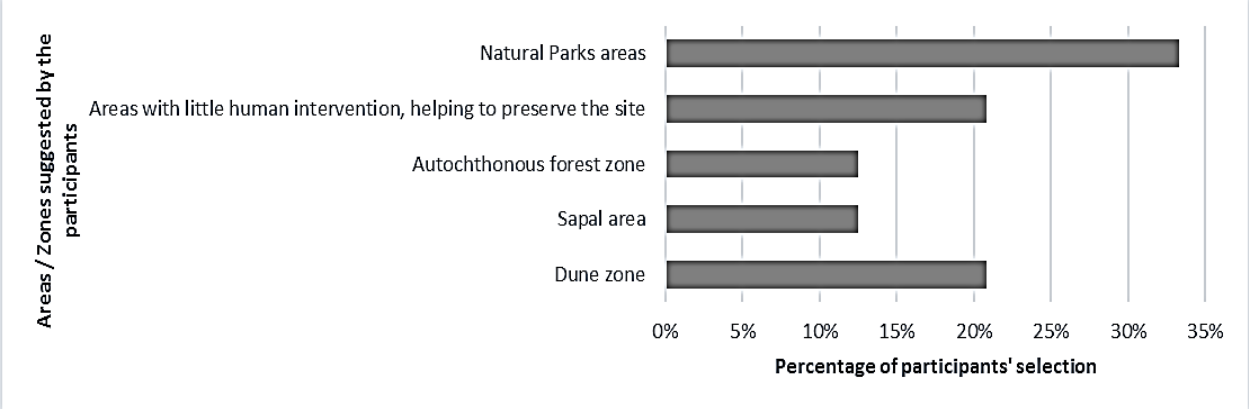

Figure 2.9 - Participants' selection of the areas / zones in which they would like to have this kind of Nature-based tourism activities.

2.4. Discussion

The vast majority of the tourists surveyed in this study who participated in these activities of Nature-based tourism were, prior to the activities, aware of the environmental problems that we currently face and already had some knowledge about the fauna, flora and habitats present in the activities site, which reveals the existence of a pattern in the target audience that seeks these activities. Although the main motivation of the tourists who seek these activities does not relates to educational purposes, as demonstrated in this study, where they mainly indicated the leisure as a reason, and in previous ones – like Ryan et al. (2000) who conducted a study in Fogg Dam Conservation Reserve in which most of the respondents' main reason to visit the place was because 'it was on the way to another venue' and Luo & Deng (2008) who got the main motivation being also leisure factors -, the majority of the participants in the present study showed a prior interest and knowledge on environment and Nature issues, when correctly responding to questions about environmental problems before the activities. Powell & Ham (2008), in their study at Galapagos National Park, registered respondents' major reason to visit the park as the viewing of beautiful and interesting wildlife. Still, the main motivation self-proclaimed by participants has rarely been pointed out as being the educational purpose, as Pratt & Suntikul (2016) revealed in their study, where the importance of having an educational experience rated the lowest of the attributes considered.

Since the purpose of Nature-based tourism activities for environmental education is to increase environmental awareness and knowledge of the participants, it would be expected that the majority of the participants would also finish these activities revealing the acquisition of new notions, knowledge and environmental awareness. However, this study revealed that the monitored Nature-based tourism activities have only had a positive impact on the environmental awareness of tourists in less than 1/6 of the surveyed participants. This means that the vast majority of participants did not increase their awareness of environmental problems by performing these activities and, thus, there is no impact. This is in line with what Powell & Ham (2008) reported about previous studies conducted by other authors who have shown that there were no significant positive impact generated by Nature-based tourism activities on the knowledge and awareness of tourists. However, Powell & Ham (2008) have registered, in their own study, a higher level of knowledge acquired in the environmental and Nature areas. Likewise, in the present study, knowledge concerning the flora and the site' environmental characteristics, demonstrated by the tourists who participated in these activities, also showed a slightly positive change. Moreover, regarding the generated impact on the faunistic knowledge of the participants, the present study supported the assumptions and conclusions of authors who argue that Nature-based tourism for educational purposes can indeed lead to positive changes in the participants' knowledge (Luo & Deng, 2008; Neves & Mateus, 2015; Powell & Ham, 2008; Ruschmann, 1999; Weaver & Lawton, 2002) since the difference, which was found to be significant, observed between the total number of correct responses and the total number of incorrect responses, after activities, was mainly due to responses concerning the fauna issues. This may be due to the fact that, in general, questions related to fauna (animals) are more likely to stimulate the interest of individuals, compared to questions of flora and site' environmental characteristics, being the knowledge, referring to these fauna themes, internalized easily. Ryan et al. (2000) also registered a higher level of respondents' knowledge acquisition concerning birds (fauna), when comparing to flora and site characteristics. As expected, in the present study, the average of correct responses obtained *a posteriori* the activities was higher than the average of correct answers given *a priori* of the activities, which revealed the occurrence of a positive

and significant impact on the general knowledge acquired by the tourists who participate in these Nature-based tourism activities for educational purposes.

Another aspect that is important to discuss, besides the simple acquisition of knowledge or the lack of it by the participants, is the perception and notion that they have about their own level of environmental knowledge. In this study, a large number of respondents thought they correctly knew certain environmental issues when, in fact, they were wrong about them. Almost half of the respondents, who said they knew the environmental importance of the sites where they carried out the activities, were wrong in what they thought to be the sites' importance, both when questioned *a priori* of the activities or *a posteriori*. Moreover, it should be noted that in post-activity surveys there was a higher percentage of respondents with a misperception of their knowledge about this question than in a pre-activity surveys, which is somehow disconcerting. Since the aim of these activities is the environmental education, it would be expected to promote the critical and analytical awareness of tourists regarding to their own level of knowledge, by confronting them with new questions and by challenging them to test their knowledge, prompting the search for a higher level of knowledge (Jacobi, 2003; Layrargues, 1999; Luo & Deng, 2008). Ryan et al. (2000) states that these Nature-based tourism activities do not always promote the construction of knowledge and environmental awareness or deliberation and reflection about the environmental knowledge and values of each one, often being limited to tourism activities that develop in Nature offering a joyful and affective experience to tourists, but without taking the best advantage of the place for environmental education purposes, as they show in their study where cognitive learning throughout visitation of Fogg Dam was seldomly registered. However, in the present study, with regard to questions about the typology of the site - Natural Reserve, Natural Park or Protected Area -, where monitored Nature-based tourism activities took place, only a few percentage of the surveyed population showed a misperception of their knowledge about this issue.

Inadequate or erroneous transmission of concepts, knowledge and information throughout these activities is a factor that deserves attention as it can either (1) generate a negative impact or (2) absence of impact - where there is no kind of tourist knowledge' change registered. As Powell & Ham (2008), Luo & Deng (2008) and Byron et al. (2014) stated, if these activities are not properly conducted, they can generate negative impacts on tourists, starting with incorrect knowledge acquisition, decreased environmental awareness and participants' dissatisfaction and ending up with reduced tourists' likelihood and willingness to return and repeat these activities (Ardoin et al., 2015). In this study, these two types of unwanted impact were verified: the (1) negative impact and the (2) absence of impact. Referring to the first type of impact, it was verified that some of respondents, after the activities, incorrectly assimilated information regarding the existence of species with special conservation status (which did not exist in any of the places where the activities took place) and, moreover, referring to the second type of impact, there were respondents who stated that, in the sites where the activities took place, the reintroduction of extinct species and/or biodiversity hotspots occurred (both statements being incorrect), and these statements were both made before and after they engaged in the activities. It can be extrapolated that, prior to the activity, these statements may have been mentioned by the respondents because they refer to concepts commonly associated with the environmental theme - "biodiversity", "extinction of species". Thus, the fact that the incorrect knowledge verified pre-activity remains post-activity demonstrated the absence of impact of the respective Nature-based tourism activities on the participants' level of knowledge. In addition, all these post-activity cases also represented information mistakenly assimilated by the participants - negative impact - as a consequence of an inadequate/erroneous transmission of knowledge during the activities.

All the post-activity negative cases, exposed in this study – the erroneous notion/conscience of participants about their own level of knowledges, the concepts misunderstood and acquisition of incorrect knowledge, the lack of changing in participants' incorrect knowledge/awareness and the small increase recorded in participants' new correct knowledge/awareness - illustrates well the worst case scenarios that can result from Nature-based tourism activities, in terms of environmental education, that fail in their structure/design: the culmination of the activities in negative impacts over the tourists' knowledge. Moreover, as already mentioned, the negative impacts are also undesirable from the perspective of offers' promotion. These scenarios could be mitigated by the implementation of different educational and communicative techniques and approaches, in the activities' design.

To promote the positive impacts of these activities and overcome the negative ones, the design of a Nature-based tourism activity is an important step for its success and, in turn, the success of this design will depend on the factors considered in its planning process and on the practice of a regular monitorization/evaluation of its efficiency (Ardoin et al., 2015; Hughes, 2013; Powell & Ham, 2008) Initially, while planning, it is necessary to define the scenario taking into account the main objectives of the activity, the target audience for the activity and the characteristics of the place where the activity will be developed, before drawing up the design. Next, the design should include specific techniques and approaches for the defined scenario, but some may be cited as universal - provided that the purpose of the activity includes the environmental education -, such as (1) environmental interpretation (Ardoin et al., 2015; Byron et al., 2014; Ham, 2007; Hughes, 2013; Powell & Ham, 2008; Thomson & Hoffman, 2005) - through interpretive signs and panels, oral interactions throughout the activity providing environmental information about the site and specific activities designed to increase environmental awareness and interest of the participant (Ham & Krumpe, 1996; Powell & Ham, 2008; Weiler & Ham, 2001)-, the (2) ability to adapt the activity according to its development, conciliating participants' satisfaction from an emotional and playful point of view with the educational content that is intended to be transmitted, (3) offering a positive experience for the participants, by the (4) opportunity of the participants to interact and contact directly with Nature (Ardoin et al., 2015; Ballantyne et al., 2009; Hacker & Miller, 2016) and (5) the richness of transmitted environmental content (Orams, 1997), (6) provide information about the transmitted values through pamphlets or digital support, so that it can be consulted during and after the activity (Hughes, 2013; Lück, 2003). Any of these techniques/approaches require a (7) dynamic and interactive posture of the tourist guide (Ardoin et al., 2015; Ballantyne et al., 2011). Finally, monitoring/evaluate the effectiveness of this design in achieving the objectives set out - including the positive impacts on participants' knowledge, awareness, attitudes and behaviours, participants' satisfaction and the activities' promotion –, is another important step to ensure that the design and activity are constantly adapted to the expected outcomes (Byron et al., 2014). This will culminate in more representative positive impact rates - regarding participants 'knowledge, attitudes, and behaviours (Byron et al., 2014; Smith et al., 2008) -, in a greater satisfaction of these participants, in an increase in the participants' interest in this type of activities - which in turn generates a higher demand for this sector (Luo & Deng, 2008) - and in a greater propensity and willingness of tourists to actively engage in environmental projects (Hughes, 2013; Lee & Moscardo, 2005; Luo & Deng, 2008; Powell & Ham, 2008).

Taking this into account, as far as the environmental interpretation is concerned, this study revealed that the activities in its general that use this approach have obtained greater success in the transmission of knowledge and environmental awareness. However, it was observed that only a few activities

demonstrate an adaptive character and the capability of shaping to the characteristics and real needs of the participants, at each moment of the activities - being these fewer activities the ones that also demonstrate a higher level of participants satisfaction -, while most of the activities do not show attention to this detail and these were the cases where it have been pointed out by the participants as a desirable detail to be taken into account. All the Nature-based tourism activities enabled the participants to interact with the environment and Nature.

The longevity and durability of the positive impacts generated on the participants' knowledge and awareness will be closely related to the emotional character of the experience (Ballantyne et al., 2011). Outstanding experiences and opportunities to witness wildlife in 'first-hand', natural history, and the whole environmental conservation theme not only represents a greater chance to enhance the environmental knowledge, attitudes, and behavioural intentions of tourists (Ardoin et al., 2015), as well as a greater probability of these impacts translating into long-term learning (Falk et al., 2012) - which is one of the main objectives of Nature-based tourism as an educational tool (Ardoin et al., 2015; Luo & Deng, 2008; Weaver & Lawton, 2002). Thus, the offer of an activity that has a positive impact in emotional terms should also be taken into account when designing the Nature-based tourism activities for educational purposes. In the present study, the longevity and durability of the positive impacts generated and their translation into long-term learning were not measured, since a sampling method with a duration of more than one year would be necessary.

The design of a Nature-based tourism activity should aim at achieving the stablished objectives and expectations with the highest efficiency, being a very important point for the success of the product offered in educational terms as well as in strategic and economic terms (Byron et al., 2014; Thomson & Hoffman, 2005). The different designs of the Nature-based tourism activities, monitored in this study, were not always efficient in meeting their settled objectives, since there were cases of negative impact generated on the participants' knowledge and the absence of impact in other cases, and even the cases recorded of positive impact over the knowledge were not that representative, compared to the global scenario. In addition, the regular monitorization/evaluation of the activities performance, in achieving the objectives set out, were not always verified among the tourist entities conducting the Nature-based tourism activities sampled in this study.

This study revealed that the activities of Nature-based tourism sampled were classified as very satisfactory experiences - for the majority of the participants - or satisfactory, with no records of negative evaluation by participants about the overall performance of the activities. However, a direct relationship could be expected between the rate of positive impact generated on participants' knowledge and the level of these participants satisfaction where, in the presence of negative impact or absence of it, the participants' level of satisfaction would also be negative/lower. However, as with this study, more studies show high levels of participant satisfaction with the overall performance of the activities, without a necessarily high rate of positive impact on their knowledge – like Powell & Ham (2008) who recorded a small increase in correct answers from pre-voyage to post-voyage and yet all of the participants were pleased with the activities and Lee & Moscardo (2008), when studying the impacts of Nature-based tourism activities preformed in an Australian ecotourism resort, whose results showed few statistically significant differences between before and after tourists' environmental knowledge, awareness, attitudes, and behaviour intentions but also high rates of overall satisfaction expressed by the participants. Perhaps the fact that, in most of the cases where there are no high positive impacts on

participants' knowledge, the participants do not even notice this lower positive impact, it may be influencing their final decision about their satisfaction with activity performance. Moreover, given the main motivation of most of these participants not being the educational aspect, it may be understandable that they did not felt dissatisfied when their knowledge did not increase as long as their primary motivation was fulfilled. In Ryan et al. (2000) some factors are pointed out as satisfaction enhancers, being the site' naturalness the most popular one among respondents. Lee & Moscardo (2008) tried to establish a correlation between the involvement of participants in environmental management practices and their satisfaction level, and found that satisfaction was linked to awareness and involvement in the environmental management practices.

Another factor explored in this study was the location, in Portugal, where participants would like to have this kind of Nature-based tourism activities offer. In geographical terms - North, Center, Lisbon and Tagus Valley, Alentejo and Algarve -, a great preference was shown for the North region of the country which could be related to the vast mountain area, forest and spaces still little intervened by Man - characteristics of this region -, such as the Peneda-Gerês National Park and the Douro River region, which have a rich biodiversity and high natural, historical, cultural and landscape values. In addition, these values offers a wide range of possible Nature-based tourism activities to be carried out. However, the Center region of Portugal was not indicated by any of the respondents, although it also includes the Douro river, which may be due to the fact that many individuals refer to the "North" as the whole area of the North and Center regions, without distinction between them. Thus, when asked about places where they would like to carry out this kind of activities, most of the participants may have indicated the "North region", referring to the northern area of the country intending, by this, to refer both to the Center and North regions.

Regarding the zones, taking into account their environmental characteristics, most of the participants mentioned that the Natural Parks would be their zones of choice, possibly because most of the time this type of Nature-based tourism activities are associated with these zones. Another reference that arises here, and arouses some interest from the analytical point of view of this study, is the mention of "Areas with little human intervention, helping to preserve these sites". This may demonstrate the interest of tourist for tourism products and non-mass destinations with some ethical value, taking into account their preservation, such as outlined by Ardoin et al. (2015) that found a growing trend of the target-audience that is becoming increasingly interested in this tourism cluster.

Nature-based tourism, when developed as a tool for environmental education and sustainable development, should include, in addition to an educational project, a physical space where activities are carried out with infrastructures and resources adapted to the activities and the target-audiences for which they are intended, and have a regular offer of activities throughout the year (more than 120 days/year) (APA, 2017b). Thereby this study emphasized the need for Portugal to invest in the improvement of these bases and also the improvement of all this touristic cluster (Gomes da Costa, 2016). Portugal already has the main local conditions that encourage the practice of these activities - hospitality, favourable weather and a vast territory of Classified Areas that have a rich biodiversity and other values - and already counts with many tourist entities operating in these areas. However, the country still has poor structures supporting the development of Nature-based tourism activities, like the lack of interpretive panels in parks and natural reserves, precarious signposting of existing tracks in certain zones and little dissemination of the regulations in force in these zones. In addition, the offer of these

activities and/or the possibility of access to some of these zones is often seasonal or restricted to reduced working hours.

Another aspect that needs greater emphasis in Portugal is the monitoring of these zones with natural and/or cultural values and the activities developed there, in order to enhance their values and their correct use. There is also a need to focus on a more efficient promotion of the existing offer of Nature-based tourism activities in Portugal, not only in order to reach a wider international market, but this aspect was also mentioned by the respondents in this study - national public - as a factor that is not properly developed at the national level. In this sense, and taking into account the data collected in this study, a factor that, if properly exploited, can contribute to a better development, usufruct and promotion of the zones with natural values and the respective Nature-based tourism activities offered there, is the role of the tourist office in the dissemination of information not only regarding the offer of touristic activities but also about the characteristics of the site and existing regulation for their use. The availability of leaflets, maps and geographical charts of the sites, with information about the existing natural and cultural values, signalling of the available tracks, ways of correctly performing them, and delimitation of areas prohibited to certain activities (or of total ban on human presence) may be some means of potentiate the tourist offices' role in promoting a Nature-based tourism for an environmental education - which in this study did not show an active role in promotion of the sampled activities, since none of the participants sought them to learn about this Nature-based tourism activities. In this line of ideas, in the future, studies could be carried out to find better designs for these Nature-based tourism activities, aiming higher positive impacts over environmental education. Testing these designs and monitoring their outcomes might help to reach an universal one who could be applied to the generality of these educational projects developed within Nature through informal education.

CHAPTER 3

Final Remarks

In general, the Nature-based tourism activities monitored here have shown a positive impact on the participants' knowledge, which is quite significant as regards the increase in the average number of correct *a posteriori* responses compared to the average of the same before the activities. However, the difference between the total of responses, post-activity, correct vs. incorrect has proved to be significant only for fauna issues. This means, in this study, different areas of knowledge were tested (taking into account the educational purposes of the monitored activities - transmission of knowledge about fauna, flora, habitats and environmental problems) and the positive impact on the knowledge of the participants here observed, is mainly due to one of the areas of knowledge tested - faunistic knowledge. In addition, there were verified some cases of negative impact on participants' knowledge and other cases of absence of impact (neither positive nor negative one).

Taking into account these outcomes and the data collected with the on-site monitoring of the activities, it can be concluded that these activities were not totally successful in transmitting knowledge and environmental awareness and, therefore, the educational techniques and approaches used in these activities may not have been the most indicated or might be in need of improvement. Thus, an investment on a better design for these activities, including more efficient techniques/approaches and pondering which are the currently obtained outcomes and which are the expected ones, may turn out to be an added value for the potentiation of the outcomes (Byron et al., 2014; Thomson & Hoffman, 2005) of these activities.

The all process' steps – planning, implementation and monitorization – of designing the activity is important. While planning a Nature-based tourism activity for educational purposes must be taken into account several factors, starting with the basic objectives of the tourism entity that promotes the activity (as is clear), concerning the objectives of the activity itself (namely to promote environmental education) and end up meeting the expectations and characteristics of the target audience. In the Nature-based tourism activities' design, with educational purpose, the presence of certain characteristics as the (1)practice of an environmental interpretation (Ham & Krumpe, 1996; Powell & Ham, 2008; Weiler & Ham, 2001), the (2)plasticity and capability of these activities to adjust to the characteristics of the present target-public and according to the course of the activities and the (3)offer of the possibility of the participants interacting dynamically with Nature (Ardoin et al., 2015; Orams, 1997), are some key points that can contribute to a greater success and efficiency of these activities in the fulfilment of their objectives and in reaching the expectations of the target-public. Monitoring of this design is needed to ensure that it is reaching the stablished objectives efficiently. The success of each step of this design will depend on the success of the previous step.

This study corroborated what some authors affirm in previous studies: there are still discordant results regarding the impacts that the activities of Nature-based tourism generate on the knowledge and environmental awareness of the participants (Ardoin et al., 2015; Budeanu, 2000; Luo & Deng, 2008; Powell & Ham, 2008; Ryan et al., 2000; Weiler & Ham, 2001), this way highlighting the importance of the continued studies in this area to deepen the understanding about the impacts of the Nature-based tourism activities, from the perspective of the participants, in an attempted to clarify these disagreements.

This way, a possible future approach to this subject may be the question of which educational techniques/approaches are specifically related to higher success rates in educational activities (Budeanu, 2000; Weiler & Ham, 2001). The implementation, in future studies, of sampling and analysis techniques that directly correlate the impacts generated after the activities with the educational techniques/approaches used in the activities, could be useful for understanding this matter and, by make it possible to improve the design of activities for greater efficiency. The type of impact generated - positive or negative, on the knowledge, attitudes, and behaviour of tourists - and the level of satisfaction shown by the tourists with the performance of the activity should be further explored. In most studies, these two factors are separately measured, with data showing in most of the cases high levels of satisfaction and, in terms of the data referring to the impact generated, in studies where data shows little or no positive impact, the discrepancy between these two data was rarely questioned. One might expect that when there was no positive impact then there would also be no high level of participants' satisfaction. However, this is not the case in most studies: the level of satisfaction is always high while the impact generated over the participants' knowledge varies. A more in-depth study of the various criteria that define and influence participant satisfaction (in addition to fulfilling their main motivation), as like the use of more specific questions about these criteria, when interviewing participants, to measure their satisfaction, may be an interesting starting-point, for a better understanding of this relation - or in this case, apparent absence of it.

The matter of the longevity and durability of the positive impacts generated in the knowledge, awareness, behaviours and attitudes of the tourists, when participating in this type of activities, can also be further elaborated. The way behavioural knowledge and intentions, displayed immediately after the activities, are transformed into long-term learning is a study that can provide a better understanding of how these activities impact individuals and lead to an efficient environmental education (Ardoin et al., 2015; Ballantyne & Packer, 2011; Ballantyne et al., 2011; Falk et al., 2012; Hughes, 2013).

A step that may benefit both tourist entities and the success of their own Nature-based tourism activities, as well as the success of environmental education promoted in these activities, is the development and implementation of an universal list of good-practices to be carried out by the tourist entities in the whole process of planning and executing of the activities, especially when talking about activities that are advertised as promoters of environmental education. In addition, it might shout to be beneficial the elaboration of an activity design, also universal - that includes the good-practices topics and, also, universal educational techniques -, applicable to all activities that have the purpose of environmental education and perpetuation of the sites' natural values.

Summarizing, it is important to continue and deepen the studies in this area, so that there is a better understanding of the effects that the Nature-based tourism activities have on environmental awareness and education for a sustainable development, in order to enhance the expected positive results and improve the Nature-based tourism activities so that they constitute a more effective tool in environmental education.

Thus, a greater investment in the design of Nature-based tourism activities - regarding the concepts' communication and transmission techniques/approaches used, and their suitability to the target-public and physical space - and the monitorization of these design' performance and efficiency in achieving the

goals drawn, might turn out to potentiate the activities' positive impacts on knowledge, awareness, attitudes and behaviour of tourists, translating into a correct transmission and acquisition of knowledge and attitudes and, therefore, promoting environmental education simultaneously with the increase of participants satisfaction level, which, in turn, translates into a greater chance of these tourists to engaging in environmental projects and converting the knowledge and attitudes acquired at the time of the activities, into long-term learning (Ardoin et al., 2015; Falk et al., 2012; Hughes, 2013; Lee & Moscardo, 2005; Luo & Deng, 2008; Powell & Ham, 2008; Weaver & Lawton, 2002). This is shown to be the most positive and promising scenario for both the Nature-based tourism cluster - since a greater number of satisfied tourists also represents, in most cases, a larger number of citizens interested in repeating these Nature-based tourism experiences, thus increasing the demand and expansion of this market - as well as for the environmental education area, since tourists more interested and involved in environmental issues constitute a society more concerned and active in sustainable environmental management. Thus, Nature-based tourism activities may in fact represent a valuable tool in environmental education for the environment sustainable management.

CHAPTER 4

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APPENDIX

Appendix 1 – *A priori* inquiry

Appendix 2 – *A posteriori* inquiry

Appendix 1

Inquérito *a priori*

Nº: _____

Olá! Sou a Inês Araújo, aluna da Faculdade de Ciências da Universidade de Lisboa e estou a fazer a minha tese de mestrado em Ecologia e Gestão Ambiental.

Neste sentido, pedia a vossa colaboração preenchendo este primeiro inquérito.

→ Insira o número do porta-chaves no canto superior direito
→ Assinale com uma cruz (x) a resposta adequada em cada pergunta de escolha múltipla
→ Escreva sucintamente, quando indicado em algumas perguntas, a resposta adequada

O inquérito é **totalmente anónimo** e sem intuito de avaliação! ☺

OBRIGADA PELA COLABORAÇÃO!!! BOA VISITA!

1. Sexo: ☐ Feminino ☐ Masculino

2. Idade: ☐ < 10 ☐ 10 - 14 ☐ 15 - 17 ☐ 18 - 20 ☐ 21 - 25 ☐ 26 - 39 ☐ 40 - 50 ☐ 51 - 65 ☐ > 65

3. Habilitações literárias: ☐ Inferior ao Ensino Básico ☐ Ensino Básico ☐ Ensino Secundário ☐ Ensino Superior - Licenciatura ☐ Ensino Superior - Mestrado ☐ Ensino Superior - Doutoramento ☐ Ensino Superior Técnico

4. Área da profissão que exerce: ☐ Ciências da Vida e Saúde ☐ Informática e Eletrónica ☐ Reformado ☐ Ciências Sociais e Humanas ☐ Ciências da Terra e Ambiente ☐ Turismo ☐ Desempregado ☐ Ciências Empresariais ☐ Engenharia ☐ Comunicação ☐ Outra: _____ ☐ Economia e Gestão ☐ Artes e Letras ☐ Administração e Secretariado ☐ Advocacia e Lei ☐ Logística ☐ Estudante

5. Como tomou conhecimento desta atividade? *(Selecionar só uma opção)*

☐ Redes sociais/Internet ☐ Website da empresa ☐ Panfletos/Brochuras ☐ Jornais/Revistas ☐ Posto de turismo ☐ Através de outra pessoa ☐ Por conhecer bem a região e atividades existentes

6. Que motivo o traz a realizar esta atividade? *(Selecionar só uma opção)*

☐ Relaxar, descontrair e fugir à rotina da cidade
☐ Por interesse no meio ambiente, animais, plantas e património ecológico/cultural
☐ Realizar atividades recreativas e praticar alguma atividade física

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Appendix 1.1 - *A priori* inquiry, applied to the participants before carrying out the activities (page 1).

7. Tem consciência dos problemas ambientais globais atuais?

☐ Não ☐ Sim. Enumere:_____

8. Tem conhecimento de alguma(s) espécie(s) de planta(s) existente(s) no local?

☐ Não ☐ Sim. Quais?_____

9. Tem conhecimento de alguma(s) espécie(s) de animal(s) existente(s) no local?

☐ Não ☐ Sim. Quais?_____

10. Tem conhecimento de qual a importância do local a nível ambiental?

☐ Sim ☐ Não

11. Se sim, qual pensa ser? *(Pode selecionar mais do que uma opção)*

☐ Proteção/conservação de habitats
☐ Hotspot de biodiversidade
☐ Representa património cultural
☐ Preservar a natureza no seu estado selvagem
☐ Reintrodução de espécies extintas
☐ Sustentabilidade de ecossistemas
☐ Representa património ecológico

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Appendix 1.2 - *A priori* inquiry, applied to the participants before carrying out the activities (page 2).

Appendix 2

Inquérito *a posteriori*

Nº: _____

Mais uma vez, peço-vos a vossa colaboração preenchendo este último inquérito.

→ Insira o número do porta-chaves no canto superior esquerdo
→ Assinale com uma cruz (x) a resposta adequada em cada pergunta de escolha múltipla
→ Escreva sucintamente, quando indicado em algumas perguntas, a resposta adequada

O inquérito é **totalmente anónimo** e sem intuito de avaliação! ☺

MUITO OBRIGADA PELA COLABORAÇÃO!!!

1. O local onde realizou a atividade é:

☐ Reserva Natural ☐ Parque Natural ☐ Não sei
☐ Nenhuma das anteriores ☐ Área Protegida

2. Existe(m) alguma(s) espécie(s) com estatuto especial de conservação neste local?

☐ Não ☐ Sim. Quais?_____
☐ Não sei

3. Com esta atividade, aprofundou o seu conhecimento sobre os problemas ambientais globais atuais?

☐ Não ☐ Sim. Sobre quais?_____

4. Sabe que espécies de plantas existem no local?

☐ Não ☐ Sim. Enumere:_____

5. Sabe que espécies de animais existem no local?

☐ Não ☐ Sim. Enumere:_____

6. Sabe qual a importância do local a nível ambiental?

☐ Sim ☐ Não

7. Se sim, qual pensa ser? *(Pode selecionar mais do que uma opção)*

☐ Proteção/conservação de habitats
☐ Hotspot de biodiversidade
☐ Representa património cultural
☐ Preservar a natureza no seu estado selvagem
☐ Reintrodução de espécies extintas
☐ Sustentabilidade de ecossistemas
☐ Representa património ecológico

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Appendix 2.1 – *A posteriori* inquiry, applied to the participants after carrying out the activities (page 1).

8. Quão satisfeito ficou com a atividade?

- ☐ Muito satisfeito
- ☐ Satisfeito
- ☐ Razoável
- ☐ Insatisfeito
- ☐ Muito insatisfeito

9. O que mais gostou?

10. O que menos gostou?

11. Que alterações sugere?

12. Em que outras regiões do país gostaria que houvesse este tipo de atividades?

13. Em que outras zonas/áreas gostaria que houvesse este tipo de atividades?

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Appendix 2.2 – *A posteriori* inquiry, applied to the participants after carrying out the activities (page 2).